

Study of Groundwater Flow in the Kruibeke Wetlands



Financed by: Ministry of the Flemish Community

Client: Ministry of the Flemish Community, Administration of Environment Nature Land and Water Management, (AMINAL) Division Nature

Date: 2001 – 2002

Budget: € 75 000

Location: Kruibeke, Bazel, Rupelmonde, Belgium

Assignment:

The Ministry of the Flemish Community plans to develop a wetland area on the left bank of the Scheldt River at Kruibeke, as a controlled flooding area. Therefore some dikes have to be constructed. The planned dike is crossing an ecological valuable area with typical wetlands vegetation. The water team was awarded the contract to study the groundwater flow for identification of suitable ecological compensation measures.

Scope of Services:

- Groundwater modelling
- Scenario analysis
- Hydrogeological conceptualisation of model area
- Analysis of water system and wetlands indicators
- Groundwater flow modelling
- Nature development

Technical Description:

The Kruibeke polder will be used as controlled flooding area to prevent flooding in the Scheldt basin during peak discharges. This controlled flood area is a unique opportunity for ecological development of the polder area. However, the dike is also to be constructed through wetlands. A

groundwater model is being developed to study the actual groundwater flow patterns. Scenario analysis will be used to identify the most suitable locations and conditions for nature restoration and for nature compensation.



The Kruibeke polder

In the polder area a typical wetland ecosystem has developed adjacent to the so-called Waasland Cuesta. Groundwater recharge from the thin quaternary cover of the Boom Clay formation constituting this important morphological feature, is the motor behind this development.

In the Scheldt valley, the clay deposit was eroded and filled by transgressive sand. This Quaternary sand forms an important aquifer which is covered by peat and polder clay.

These layers have been conceptualised in a model, configured with MODFLOW.

An important feature is the manifold drainage ditches in the polder and the fact that the average level of the tidal bound Scheldt river is higher than the polder ground level.



Soresma nv
Britselei 23
B-2000 Antwerpen
tel. +32 (0)3 221 55 00

Soresma nv - haecon
Poortakkerstraat 41
B-9051 Gent
tel. +32 (0)9 261 63 00

Soresma sa
Chaussée de Louvain 484
B-5004 Namur
tel. +32 (0)81 20 18 91

info@soresma.be
www.soresma.be
Dr. ir. Marc Huygens
Contract Manager

The model is calibrated with water level data from a piezometer network owned by the Institute of Nature Conservation, who assists the study in evaluating the hydro-ecological effects of groundwater flow and variable groundwater levels.

Proper boundary conditions were defined from the natural water system features, while ecological features (such as phreatophytes) were used to validate both the model quality and sensitivity.

